66. A core panel as defined in claim 65 and including at least one skin having inner and outer layers of porous and fibrous material, and a resin barrier film of adhesive material between said layers.

67. A core panel as defined in claim 57 wherein said strips comprise translucent foam material, and including translucent skins overlying said core surfaces.

68. A core panel as defined in claim 57 and including at least one internal sheet of porous and fibrous material extending within said core generally parallel to said opposite core surfaces, and said struts extend through said sheet.

REMARKS

The Office Action has been carefully reviewed in light of the cited references and the Examiner's comments, and accordingly, Applicants are adding new claims 39 & 40 which depend from allowed claim 22 and are replacing the rejected claims with new claims 41-68 to distinguish Applicants' invention more clearly and to place these claims in condition for allowance with claims 22-26, the allowance of which is hereby noted. Applicants affirm the election of article claims in Group 1 with new independent claim 41 replacing the original claim 14, and new independent claim 57 replacing the original claim 1. Applicants have also amended page 4 to delete the reference to Patent No. 5,701,234, and are enclosing a Petition for a three month extension of time along with the appropriate fee.

In reference to new claim 41 which replaces claim 14, Applicants' fiber reinforced core panel 191 is disclosed in connection with FIGS. 12-14. The core panel 191 (FIG. 14) has opposite core surfaces adapted to be attached to corresponding skins 192 by a hardenable resin and includes a plurality of elongated strips 170 (FIG. 12) of low density cellular material, a first layer 176 (FIG. 12) of fibrous rovings 175 continuously and helically surrounding each of the strips along

the length thereof, and the elongated strips 178 (FIG. 13) with the helically surrounding rovings are connected together to form a unitized core panel 191 (FIG. 14) with the rovings 175 extending over the core surfaces for receiving the skins and adapted to be moved as a preformed unit to a molding process where the resin is hardened.

Applicants are thoroughly familiar with the disclosure of Day '082 of which one of Applicants is the patentee and which issued to the Assignee of the present invention. In the embodiments shown in FIGS. 38-40 of the Patent, all of the webs 422, 432 and 448 extend through the thickness of the core panel perpendicular to the core panel surfaces, and edge portions of the webs are attached to the overlying skins. There is no suggestion in this patent or any of the other references of Applicants' layer 176 of fibrous rovings continuously and helically surrounding each of the strips along the length thereof, as set forth in new claim 41. On the other hand, Applicants have found that their panel with skins adhesively attached provides a shear strength substantially over 50% greater than a composite panel using a core panel constructed as disclosed in connection with FIGS. 38-40 of Day '082. The helically surrounding rovings along the length of each strip forming Applicants' core panel not only form the webs between the strips, but also result in substantially higher strength attachment of the fibrous rovings to the skins since the web fibers are continuous and do not terminate adjacent the skins. Moreover, when Applicants' strips have a single layer of helically surrounding rovings and are placed in adjacent relation, the rovings cross to form the webs between the strips, thereby adding substantial strength to the core panel while minimizing the weight and costs of the rovings forming the webs in the core panel.

Applicants are also unable to find any suggestion or teaching in the references of the more specific structure of Applicants' fiber reinforced core as set forth in the claims 42-56 which depend from claim 41. For example, there is no suggestion of Applicants' second layer 177 (FIG. 12) of fibrous rovings continuously

and helically surrounding the first layer 176 on each strip 170 along the length thereof with the rovings 177 extending helically in an opposite direction and crossing the rovings in the first layer, as set forth in claim 42, or the generally parallel continuous fibrous rovings 180 (FIG. 12) extending longitudinally along each of the strips adjacent the first layer of helically extending rovings 176, as called for in claim 44 , or the internal resin distribution grooves of claim 51, or the translucent foam material and translucent skins of claims 53, or the internal transverse reinforcing members 222 (FIG. 16) of claim 55.

New claim 57, which replaces original claim 1, is directed to the core panel embodiments of FIGS. 1-5. As shown in FIG. 1 and set forth in claim 57, the fiber reinforced core panel 31 includes webs 34 of fibrous material separating the opposing faces of the adjacent strips 33 of low density cellular material, the webs extending between the opposite core surfaces with portions of the webs being exposed at the opposite core surfaces, a plurality of rows of reinforcing struts 35 extending between the opposite core surfaces at an acute angle relative to the webs and extending through the webs, and the struts comprising fibrous rovings enclosed by the strips. Applicants have found this core structure with the webs and struts stabilizing each other, substantially increases the compressive, bending and shear strength of a composite panel using Applicants' core panel. As the Examiner indicates on page 5 of the Office Action, neither Day '082 nor the European '805 Patent or any of the other references suggests or teaches this improved structure set forth in new claim 57 and which provides very important strength advantages. Moreover, the references fail to disclose or suggest the combination of the additional structure of Applicants' core panel as recited in new claims 58-68 which depend from claim 57.

In view of the fact that Day '082 and EP '805 in no way teach or suggest the above new structure included in new claim 57, Applicants respectfully submit that a Double Patenting rejection does not apply to claim 57. Also, the mere fact that

the cited references could be modified to arrive at Applicants' new structure, as set forth in new claims 41 & 57, does not make Applicants' structure obvious unless the references teach or suggest the new structure. Moreover, as the Examiner knows, Applicants' claimed invention may not be used as an instruction manual or template to piece together the teachings of the prior art so that the claimed invention is rendered obvious.

In view of the foregoing, Applicants believe that each of new independent claims 41 and 57 and the claims dependent therefrom defines a core panel structure which is clearly distinguished from the references. Accordingly, Applicants believe that these claims are in condition for allowance with claims 22-26, 39 and 40, and respectfully request that this application be passed to issue. Applicants are including an Amended page 4 and a sheet with markings showing the amendment to page 4. Applicants also request that the reference patents enclosed with Applicants' Information Disclosure Statement filed April 17, 2001 be acknowledged by the Examiner and be included in the list of cited references.

Respectfully submitted,

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be attached together to form a structural core without the addition of rows of structural struts. In this configuration, the contiguous or adjacent sides of wound strips of rectangular cross section form web elements having I-beam flanges for attachment to panel skins. In contrast to the disclosure of U. S. Patent No. 4411939, the fibrous extensions of each core web are attached to panel skins on both sides of the web rather than only one, greatly increasing the shear strength of the resulting panel. This permits the use of lighter and less expensive webs for a given strength requirement. Similarly, the present invention provides markedly improved core-to-skin attachment and shear strength when compared to the structure disclosed in Applicant's U.S. Patents No. 5,462,623, No. 5,589,243 and No. 5,834,082. In tests, webs comprised of circumferentially wound rovings exhibit 75% greater shear strength than those whose end portions terminate adjacent the panel skins. Each wound strip may be provided with internal transverse reinforcing webs to provide bi-directional strength and stiffness. Roving-wound cores may also be formed using strips of triangular cross section.

The winding of rovings by machine and the consolidation of the fiber-wound strips into a single core have both economic and handling advantages. It is common for a single composite bridge deck panel or yacht hull constructed in accordance with U. S. Patent Nos. 5904972 or 5958325 to comprise a thousand or more individual core blocks. The labor component of producing these individual cores is very high. Reinforcement fabric is cut into sheets which are wrapped and glued around each separate core, or smaller pieces of fabric are glued to the separate faces of each core, or tubular fabrics are first formed and the cores inserted into them. These processes become increasingly difficult as the dimensions of the core components decrease. Arrangement of these cores in a mold is also labor intensive, expensive and time consuming, which restricts the number of panels which may be produced from a mold in a given period of time. Positioning of individual core blocks becomes increasingly awkward as the curvature of the mold increases or as the mold surface departs from horizontal. The cores which are the subject of the present invention

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The winding of rovings by machine and the consolidation of the fiber-wound strips into a single core have both economic and handling advantages. It is common for a single composite bridge deck panel or yacht hull constructed in accordance with U. S. Patent Nos. [5701234,] 5904972 or 5958325 to comprise a thousand or more individual core blocks. The labor component of producing these individual cores is very high. Reinforcement fabric is cut into sheets which are wrapped and glued around each separate core, or smaller pieces of fabric are glued to the separate faces of each core, or tubular fabrics are first formed and the cores inserted into them. These processes become increasingly difficult as the dimensions of the core components decrease. Arrangement of these cores in a mold is also labor intensive, expensive and time consuming, which restricts the number of panels which may be produced from a mold in a given period of time. Positioning of individual core blocks becomes increasingly awkward as the curvature of the mold increases or as the mold surface departs from horizontal. The cores which are the subject of the present invention